

REMARKS/ARGUMENTS

Claims 1, 3-13 and 15-20 stand rejected, with claims 2 and 14 objected to in the outstanding Official Action. Claims 1, 2, 17 and 20 have been amended and therefore claims 1-20 remain in this application.

The Examiner's indication of PTO acceptance of the previously filed formal drawings is very much appreciated. Additionally, the Examiner's confirmation of receipt of Applicants' claim for priority and the certified copy of the priority document is very much appreciated.

Beginning on page 5, section 3 of the Official Action, the Examiner rejects claim 20 under 35 USC §112 (first paragraph) as being unsupported by the written description. This rejection is respectfully traversed. By way of explanation, the Examiner notes in the sentence bridging pages 5 and 6 of the Official Action that the original claim 20 language read "an electromagnetic energy transmitter, in which said received signal comprises a reflection of part of the electromagnetic energy by an object . . ." The Examiner construes this language to mean that the "transmitter" receives "said received signal." However, the term "said received signal" has antecedent basis in the earlier paragraphs of claim 20 and the comma after the word "transmitter" clearly indicates that the reference to the "received signal" is not necessarily associated with a capability of the "electromagnetic energy transmitter." Accordingly, Applicants believe that the original language of claim 20 was correct.

However, in order to clarify the interrelationship between the "received signal," the "transmitter" and the "electromagnetic energy" and to confirm that the transmitter can be a separate structure from the receiver, Applicants have amended the last paragraph of claim 20 to read "an electromagnetic energy transmitter, wherein said received signal comprises a reflection by an object of part of the electromagnetic energy transmitted by said transmitter, and said

optical time delay” While this is not exactly the proposed language by the Examiner, it is believed to claim the embodiment disclosed in Applicants’ specification and to be completely supported thereby.

In view of the above amendment to claim 20, it is believed that both the original language and the amended language is fully supported by the specification and any further rejection under 35 USC §112 is respectfully traversed.

On page 24, section 8 of the Official Action, the Examiner indicates that claims 2 and 14 contain allowable subject matter and this notification is very much appreciated. However, Applicants note that the language of claim 2 limits the invention of claim 1 to an embodiment in which one of the optical paths receives and delivers signals all in the same duty cycle on-time. As discussed in Applicants’ specification, page 6, lines 9-12, the claim 2 interrelationship is not essential to the operation of the invention. The primary invention is related to processing signals received in different “time bins” and delivering them in the same “duty cycle on-time.” It is noted that one of the optical paths might lead directly from the signal splitter 13 to the signal combiner 14 which will have a finite length and therefore some very slight time delay.

Applicants have amended independent claims 1 and 17 to clarify the compression of time in which a signal can be received into the limited duty cycle on-time of the detector by the use of one or more optical time delays. These amendments are supported by the disclosure on page 5, lines 15-32, which describes delays 21, 31 and 42 in transmitting signals from different time periods to the detector in the same on-time duty cycle. As will be seen, this is clearly not envisioned by any of the cited prior art references.

On page 6, section 5 of the Official Action, claims 1, 3-11, 13 and 15-18 stand rejected under 35 USC §103 as unpatentable over Buser (U.S. Patent 4,380,391) in view of Misek (U.S. Patent 4,079,246) and Boivin (U.S. Patent 6,141,127).

The Examiner's admission that "Buser does not expressly disclose: a first optical time delay . . ." (as set out in the last paragraph of the previously amended claim 1) is appreciated.

The Examiner on page 2, section 2, also points out that the Buser reference is switched off and on for range gating purposes and the Examiner disputes Applicants' prior statement that "there is no suggestion in Buser of using a detector that is every switched off." The Examiner's argument is correct and the Buser reference is switched on and off. However, Applicants' prior argument should have included an additional clause, i.e., it should have read "there is no suggestion in Busser et al of using a detector that would every be switched off when a wanted (in-range) signal could be expected to be received." While Buser, as the Examiner suggests, does indeed switch on and off for "range gating," there is no suggestion that it would ever be switched off when an in-range signal could be expected to be received.

Obviously Applicants' optical time delays permit the detector to be switched off when a "wanted (in-range) signal could be expected to be received" but, due to the optical delays, the detector only need be switched on when the delayed signals actually arrive at the detector. Hopefully, this language clarifies the Applicants' previous misstatement and the distinction that was intended to be emphasized over the Buser reference. The Examiner's admission with respect to Buser failing to teach a "first optical time delay . . ." is very much appreciated.

It is also noted that Buser would appear to teach away from Applicants' claimed invention. The range gating of Buser produces a limited duty cycle on-time and it is known that the whole point of "range gating" is that signals received outside the on-time are excluded.

There is really no possibility that one would try to bring signals received in the time the receiver is off to block out signals to the receiver. It would simply be counterproductive to operate in this fashion. Accordingly, Buser's teaching would preclude the operation of a system in accordance with Applicants' claimed invention.

The Examiner cites the Misek reference which converts multiple optical signals into multiple electrical signals and then delays and adds the electrical signals to compensate for "smearing" and for improving signal to noise ratio of received signals. Misek is not apparently relevant to Applicants' claimed invention because the problem the Applicants solve is a problem relating to an optical detector which is switched off periodically. Nothing is switched off in Misek when a wanted signal might be received, whether that signal is electrical or optical. Misek has no "duty cycle on-time."

Additionally, what happens after a received optical signal is converted into an electrical one is not really relevant. It is the problem of an optical detector which might be switched off when a wanted signal arrives that is solved by the embodiments of Applicants' invention. Not only does Misek not teach the missing "first optical time delay" that the Examiner admits is missing from Buser, but Misek's use of multiple optical detectors without any suggestion that any of them would ever be switched off when a wanted signal would be coming in would preclude Applicants' claimed combination of elements.

The Examiner's admission in the sentence bridging pages 9 and 10 of the Official Action that "Misek does not expressly teach the optical paths that receive an electromagnetic signal and then transmit the received signal to a signal detector, and an optical time delay within one of the optical paths to delay the received optical signal and transmit the delayed signal to the detector" is very much appreciated.

The Examiner, for the missing part in the Misek reference, cites the Boivin reference and Applicants agree that it is known that optical delay lines can be used to delay optical signals. However, there appears to be no disclosure in either Misek or Boivin of an optical detector having a limited duty cycle on-time or the use of an optical delay to compress a relatively long time in which a wanted optical signal can be received and slotted into a shorter duty cycle on-time. Buser's disclosure of a detector having a limited duty cycle is pertinent, but it is limited for range purposes and there would be no point at all in trying to pick up signals outside the duty cycle on-time because it is range-gated specifically to cut out signals received from the wrong range.

Applicants' amended independent claims 1 and 17 clearly recite the first optical time delay for one of the optical paths so as to delay an earlier received signal to be received by a signal detector within the duty cycle on-time. This aspect is not disclosed in any of the cited prior art references and therefore there is no *prima facie* case of obviousness under 35 USC §103. If all claimed elements and claimed interrelationships between elements are not disclosed somewhere in the Buser/Misek/Boivin combination, there can be no *prima facie* case of obviousness. It is noted that the burden is on the Examiner to identify evidence of the amended claims 1 and 17 elements and interrelationships in the combination of references, and at least with respect to the amended claims, this is not possible in view of the Buser/Misek/Boivin combination.

Even if all claimed elements/method steps were disclosed and all claimed interrelationships between elements and steps were disclosed in the Buser/Misek/Boivin combination, there is also a burden on the Examiner to provide reasons why elements/steps would be chosen from the various reference and then combined in the manner of Applicants'

claims. In its recent decision, the U.S. Supreme Court in *KSR International Co. v. Teleflex Inc.*, 82 USPQ2d 1385 (April 2007), held that it is often necessary for a court to look to interrelated teachings of multiple patents, the effects of demands known to the design community or present in the marketplace and the background knowledge possessed by a person of ordinary skill in the art in order to determine whether there was an apparent reason to combine the known elements in the fashion claimed by the patent at issue. The Supreme Court held that “[t]o facilitate review, this analysis should be made explicit.” *Id.* at 1396.

The Supreme Court in its *KSR* decision went on to say that it followed the Court of Appeals for the Federal Circuit’s advice that “rejections on obviousness grounds cannot be sustained by mere conclusory statements; instead, there must be some articulated reasoning with some rational underpinning to support the legal conclusion of obviousness” (the Supreme Court quoting from the Court of Appeals for the Federal Circuit in *In re Kahn*, 78 USPQ2d 1329 (Fed. Cir. 2006)).

On page 11, first paragraph, the Examiner concludes that “it would have been obvious to one of ordinary skill in the art at the time the invention was made to apply the delay lines as taught by Misek and Boivin to the system of Buser so that optical signals from the same nominal direction in space are delayed by the optical delay lines.” However, this is not the required explicit “analysis” and instead is a mere unsupported conclusory statement as to obviousness. The Examiner provides no indication of any rationale as to why one would seek to pick and choose elements or modify any of the references in accordance with the other references. It is clear that Buser does show a detector having a limited duty cycle, but it is specifically limited for range purposes. There would be no point at all in Buser in trying to pick up signals outside the duty cycle on-time because it is “range-gated” specifically to cut out such signals (from the

wrong range). In order to arrive at the presently claimed invention, one of ordinary skill in the art would have to take the general concept from Boivin using optical delays lines to delay optical signals, reverse the way these optical delays lines are used in Boivin (by bringing the optical signal components together instead of separating them to create a time multiplex) and then import these reversed optical delay lines into Buser in order to bring unwanted (out of range) signal content into the on-time of the optical detector in Buser. The Examiner does not provide any rationale as to why one would reverse the teachings of the cited prior art references in this fashion and therefore the second prong of a *prima facie* case of obviousness has not been made.

Furthermore, even if a *prima facie* case of obviousness has been set out in the outstanding Official Action, if a prior art teaching precludes the combination, then this adverse teaching rebuts any *prima facie* case of obviousness that has been made. Applicants note that Buser requires “range gating” which excludes received signals outside the “on-time” duty cycle. Thus, one attempting to combine the Buser, Misek and Boivin references would have to ignore this aspect of the Buser reference which would preclude Applicants’ claimed combination.

Additionally, Misek fails to disclose any benefit or criticality to a “duty cycle on-time” and merely converts optical signals into electrical signals and then processes those electrical signals to compensate for smearing and improved signal to noise ratio. There is really nothing to do with the present invention and therefore the electrical signal processing of optical signals in Misek would preclude Applicants’ claimed combination of optical delaying so as to receive reflected signals from different time periods within the desired duty cycle on-time.

As noted above, Boivan uses optical delays to timewise (temporally) separate the optical signals which precludes the use of optical delays to bring the optical signals within a desired duty cycle on-time.” Clearly Boivan would teach away from the claimed invention.

With each of Buser, Misek and Boivan all providing adverse teaching with respect to the claimed invention, one of ordinary skill in the art would be “led away from” the claimed invention. Therefore, even if a *prima facie* case of obviousness were made out (and this contention is strenuously traversed), the adverse teachings in Buser and Misek would rebut such a *prima facie* case.

The Examiner very helpfully supplies a response to previous arguments on pages 2-5 of the Official Action. Applicants’ first argument has already been discussed above, and Applicants’ statement was incorrect as the Examiner notes. However, Applicants’ modified statement, i.e., “there is no suggestion in Buser et al of using a detector that would every be switched off when a wanted (in-range) signal could be expected to be received” is believed to be correct.

Beginning on page 3 in regard to Applicants’ second argument, that Boivin teaches the direct opposite of the effect of delay lines specified in Applicants’ independent claims, the Examiner notes that “although claims are interpreted in light of the specification, limitations from the specifications are not read into the claims.” Applicants have amended independent claims 1 and 17 to more clearly specify that there are “at least two optical paths” and there is “a first optical time delay within one of said optical paths.” In accordance with amended claim 1, the optical path which includes the delay is received during an earlier time period than a second undelayed signal is received and both are applied to the signal detector “within said duty cycle on-time.” Of course, the benefit of this practice is to extend the operational range of the signal detector by compressing the real time during which a signal can be received from the optical paths during the on-time of the signal detector. This interrelationship is now clearly set out in Applicants’ independent claims.

Regarding Applicants' argument #3 and the Examiner's response thereto (pages 4 and 5 of the Official Action), Applicants made the point that the Boivin reference does the direct opposite of Applicants' independent claims (Boivin timewise stretches out the signals rather than having them provided to a detector during the desired duty cycle on-time). The above-discussed amendment to those independent claims clarifies that this is the correct analysis of Applicants' claims.

The Examiner does not appear to dispute that Boivin does indeed the opposite of Applicants' claimed embodiment, i.e., as discussed in Boivin, column 3, lines 4-8, "an optical signal having a plurality of wavelength division multiplex channels is generated, split, delayed by a desired amount, modulated and then combined into a single signal such that individual WDM channels are in temporally [timewise] spaced relation to one another." Quite clearly, this is the direct opposite of combining WDM channels into a single time period, i.e., the claimed "limited duty cycle on-time" of the claimed detector, and rather, Boivin teaches interleaving the signals into a signal with separate time slots representing the various WDM channels.

The Examiner now states that "the system disclosed by Boivin can be used to combine the signals of different time slots together into a single time period" but this contention does not indicate that this is what Boivin teaches. Whether the Boivin system could be modified to do the direct opposite of what it teaches is a moot point. The issue is what is actually disclosed by the Boivin reference, not what the apparatus of Boivin could be modified to do. Again, because Boivin specifically teaches away from Applicants' claimed combination, it is an adverse teaching and rebuts any *prima facie* case of obviousness as noted above.

The Examiner's detailed discussion of the three cited references in the rejection at paragraph 5 on page 6 of the Official Action is very much appreciated. However, in view of the

above amendments to the claims and the adverse teachings contained in each of these three references, Applicants believe that claims 1 and 17 and claims dependent thereon are clearly patentable over the combination of reference and any further rejection thereunder is respectfully traversed.

Claim 12 stands rejected under 35 USC §103 over the Buser/Misek/Boivin combination, further in view of Guscott (U.S. Patent 4,339,748) and Halldorsson (U.S. Patent 4,674,874). Inasmuch as claim 12 ultimately depends from claim 1, the above comments distinguishing claim 1 from the Buser/Misek/Boivin combination are herein incorporated by reference.

The Examiner does not allege that Guscott and Halldorsson teach the missing structures and interrelationships between structures specified in independent claim 1 and therefore even if all five references are combined, they do not evidence a *prima facie* case of obviousness because they fail to meet the first prong of the required evidence. The second prong, i.e., the rationale for combination, is also not disclosed in section 6 on pages 22 and 23 of the Official Action. Accordingly, the Examiner has not met his burden of establishing a *prima facie* case of obviousness. Further, the Examiner does not apparently appreciate that Buser, Misek and Boivin all contain adverse teachings which would lead one of ordinary skill in the art away from the claimed invention.

In view of the above, it seems clear that the Buser/Misek/Boivin/Guscott/Halldorsson combination does not support a *prima facie* case of obviousness under 35 USC §103 and any further rejection thereunder is respectfully traversed.

Claim 19 stands rejected under 35 USC §103 over the Buser/Misek/Boivin combination, further in view of Halldorsson. Inasmuch as claim 19 ultimately depends from claim 17, the

above comments distinguishing claim 17 from the Buser/Misek/Boivin combination are herein incorporated by reference.

The Examiner does not allege that Halldorsson teaches the missing structures and interrelationships between structures specified in independent claim 17 and therefore even if all four references were combined, they do not evidence a *prima facie* case of obviousness because they fail to meet the first prong of the required evidence. The second prong, i.e., the rationale for combination, is also not disclosed in section 7 on page 24 of the Official Action. Accordingly, the Examiner has not met his burden of establishing a *prima facie* case of obviousness.

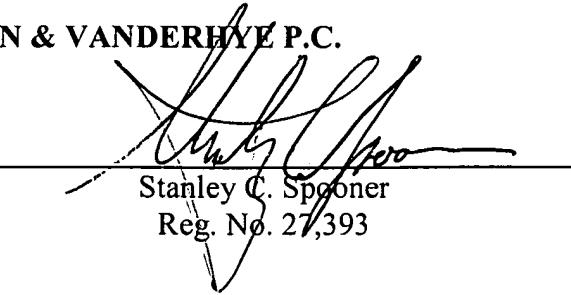
Further, the Examiner does not apparently appreciate that Buser, Misek and Boivin all contain adverse teachings as noted above which would lead one of ordinary skill in the art away from the claimed invention. In view of the above, it seems clear that the Buser/Misek/Boivin/Halldorsson combination does not support a *prima facie* case of obviousness under 35 USC §103 and any further rejection thereunder is respectfully traversed.

Having responded to all objections and rejections set forth in the outstanding Official Action, it is submitted that claims 1-20 are in condition for allowance and notice to that effect is respectfully solicited. In the event the Examiner is of the opinion that a brief telephone or personal interview will facilitate allowance of one or more of the above claims, he is respectfully requested to contact applicant's undersigned representative.

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Respectfully submitted,

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